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### NOTE ON THE FOREGOING, BY PROFESSOR HOLDEN.

Those who are interested in the matter discussed by Mr. RITCHIE should note, *first*, that if the "relations are obscured" by anything which I have written, the obscuration was not intentional, as I took special pains to say in private letters addressed both to Dr. CHANDLER and to him; *second*, that the facts I give are all from official sources; and, *third*, that Mr. RITCHIE points out that the official correspondence as printed does not present the story in all its details. Mr. RITCHIE'S note should, then, be read in connection with the official papers from which I quoted.

EDWARD S. HOLDEN.

## ELEMENTS AND EPHEMERIS OF COMET *b*, 1896.

COMMUNICATED BY FREDERICK H. SEARES.

The following elements of Comet *b*, 1896, have been computed by Professor A. O. LEUSCHNER and myself:

$$
\begin{array}{rl}
T = & \text{April } 17.6516 \text{ Gr. M. T.} \\
\left.\begin{array}{rrrr}
\omega = & 1^\circ & 45' & 5'' \\
\Omega = & 178 & 15 & 31 \\
\pi = & 180 & 0 & 36 \\
i = & 55 & 35 & 26
\end{array}\right\} & 1896.0. \\
\log q = & 9.75307
\end{array}
$$

$$\text{O—C.} \quad \Delta\lambda \cos\beta = -1''.2. \quad \Delta\beta = +4''.4.$$

These elements are based upon observations made at the LICK Observatory by Professors HUSSEY and AITKEN on April 16th, 17th, and 19th, which were telegraphed to the Students' Observatory by Dr. HOLDEN. They do not present any special resemblance to any of the elements given in the available comet catalogues. The following ephemeris has also been computed.[*]

UNIVERSITY OF CALIFORNIA,
Students' Observatory, 1896, April 22.

## OBSERVATIONS OF DARK MARKINGS ON *VENUS*, 1889.

BY EDWARD S. HOLDEN.

During the months of May and June, 1889, I examined the surfaces of the planets *Uranus*, *Saturn*, *Venus*, and *Mercury* on every suitable occasion. *Venus* was observed every day, during daylight, with the twelve-inch or thirty-six-inch equatorial, and often in the morning twilight with the former instrument. On most occasions, there was little or nothing to record. On five dates I made sketches, showing the outlines of dark areas on the planet's disc. These diagrams are reproduced in the accompanying plate.* The dark areas in the plate are many times darker, relatively, to the paper than the corresponding very faint and elusive markings on *Venus*, relatively, to the brilliant surface of the planet. The dates recorded are the astronomical days. The best view of *Venus* was obtained on May 29th, an hour or so before noon. (*See* the two upper diagrams in the plate.)

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[*] The ephemeris (for every day from April 23.5 to May 25.5) is omitted here.—*The Committee on Publication.*

At $3^h$ $18^m$, Sid. time, with the twelve-inch equatorial, the first drawing was made. The southern half of the planet was much less bright than the northern. The surface was covered with a faint shading, and part of this shading (near P) was darker than the rest.

At $3^h$ $53^m$, Sid. time, with the thirty-six-inch equatorial, a second sketch was made. (*See* the plate.) At P, there was an obvious notch in the terminator. At Q, a second notch was suspected. Near the south cusp, S, there was much detail which was too poorly seen to be drawn (at $4^h$ $30^m$ Sid. time).

At *x x x*, the planet is very bright. Some of the dark shadings may be due to contrast only. I believe the main outlines to represent real features. The notch P seems to be certain.

At $16^h$ $30^m$, P. S. T., June 3d, with the twelve-inch equatorial, a sketch was made. (*See* the plate.) Besides the shading at the terminator, there are two regions, *a* and *b*, well seen.

At $16^h$ $50^m$, P. S. T., June 10th, with the twelve-inch equatorial, a sketch was made. (*See* the plate.)

At *x x x*, the surface was very brilliant. At R, the terminator seemed serrated, "perhaps due to irradiation from *x x x*."

At $23^h$, P. S. T., June 11th, with the twelve-inch equatorial, a sketch was made. (*See* the plate.) The image was poor. There appeared to be two dark areas, *a* and *b*, as drawn; and I could not be certain whether or no they were connected at ?.

I am inclined to think that much, if not all, of the dark shadings of the last two sketches may be due to contrast with the very brilliant border of the planet. The shadings of 1889, June 3d, may be due to the same cause. Those of May 29th, are probably real, and may serve to compare with other drawings for the determination of the rotation-time.

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* They have usually been copied from the observing books by tracing them on a piece of ground glass placed over the original sketches. The copies are then finished, photographed, and a paper-print sent to the engraver. I believe this is the most rapid and sure method of copying such diagrams.

# THE COMPANION OF *SIRIUS*, AND ITS BRIGHTNESS ACCORDING TO PHOTOMETRIC THEORY.

By William J. Hussey.

The companion of *Sirius* was last observed by Professor Burnham in April, 1890, with the thirty-six-inch telescope of the Lick Observatory. In October, November, and December of that year, and in October of the following year, he examined *Sirius* on five nights under good conditions, but was unable to see the companion. At that time the companion was within 4″.2 of its primary, and the distance was decreasing. Since then, according to the elements that have been computed, it has passed its minimum distance, and at the beginning of this year (1896) was at about the same distance as when last observed in 1890. This being the case, it was expected that the companion could be observed again in the early part of this year. I have looked for it with the thirty-six-inch telescope as follows:

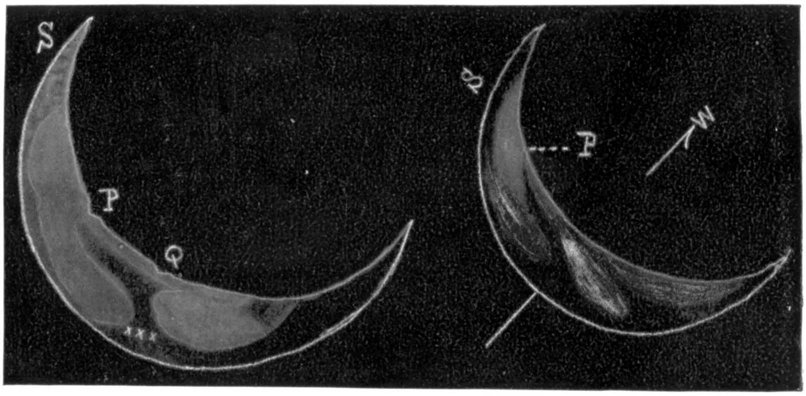
1896, February 9.—Examined *Sirius* carefully when near the meridian, using various powers, from 350 to 1900. Seeing good. Companion not seen.

February 14.—Seeing good. Companion not seen.

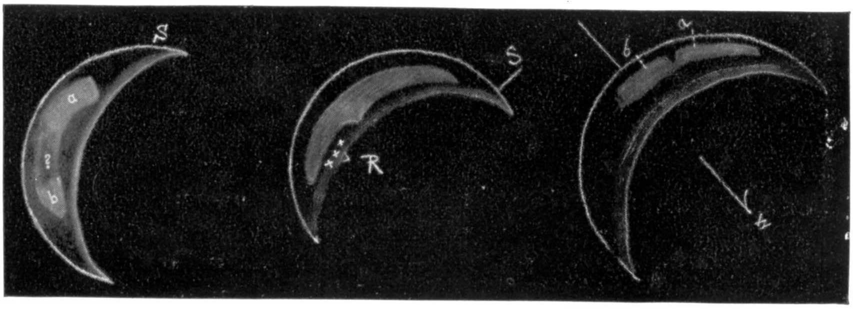
February 19.—Examined *Sirius* with powers 270, 1900, and 2600. The micrometer wire was set to the ephemeris place of the companion, and the entire region thereabouts examined carefully. Seeing good. Companion not seen.

March 11.—Examined *Sirius* with powers 350, 550, 1000, 1900, and 2600. Each eye-piece was provided with a diaphragm, accurately at its focus, covering half the field of view. By this means *Sirius* could be placed out of view, and the region close about it still examined. Seeing very good. Companion not seen.

March 12.—Examined *Sirius* with powers 350, 1000, 1500, 1900, and 2600. Eye-pieces were provided with diaphragms, as



1889, May 29, $3^h\ 53^m$, Sid. T. 36 inch. 1889, May 29, $3^h\ 18^m$, Sid. T 12-inch.



1889, June 11, $23^h$. P. S. T.
12-inch.

1889, June 10, $16^h\ 50^m$, P. S. T.
12-inch.

1889, June 3, $16^h\ 30^m$, P. S. T.
12-inch.

E. S. H. delt.

DIAGRAMS OF THE PLANET *VENUS.*